

Abstract Of The Disclosure

Described herein is a method and apparatus for transmission that provides the performance of space time spreading (STS) or orthogonal transmit diversity (OTD) and the backwards compatibility of phase sweep transmit diversity (PSTD) without degrading

5 performance of either STS or PSTD using a symmetric sweep PSTD transmission architecture. In one embodiment, a pair of signals  $s_1$  and  $s_2$  are split into signals  $s_1(a)$  and  $s_1(b)$  and signals  $s_2(a)$  and  $s_2(b)$ , respectively. Signal  $s_1$  comprises a first STS/OTD signal belonging to an STS/OTD pair, and signal  $s_2$  comprises a second STS/OTD signal belonging to the STS/OTD pair. Signals  $s_1(b)$  and  $s_2(b)$  are phase swept using a pair of phase sweep frequency signals that would cancel

10 out any self induced interference. For example, the pair of phase sweep frequency signals utilize a same phase sweep frequency with one of the phase sweep frequency signals rotating in the opposite direction plus an offset of  $\pi$  relative to the other phase sweep frequency signal. The resultant phase swept signals  $s_1(b)$  and  $s_2(b)$  are added to signals  $s_2(a)$  and  $s_1(a)$  before being amplified and transmitted.